Section 5 Control of Work

Section 5
Control of
WorkWork

3-501 General

3-501
General

Section 5, "Control of Work," of the *Standard Specifications,* details how contract work will be controlled. The proper performance of the contractor and the engineer ensure control. During the manufacture of products and the execution of the project, the contractor performs all actions necessary to ensure the work has the required attributes. The engineer samples, tests, and inspects the work to determine if the characteristics conform to the contract requirements.

3-502 Authority of Engineer

3-502
Authority
of Engineer

The term "engineer," as used in Section 5-1.01, "Authority of Engineer," of the *Standard Specifications,* means the "chief engineer" acting through authorized representatives. The authorized representatives must act in accordance with the chief engineer's policies and procedures, and in the absence of written instruction, the representatives must exercise judgement within their span of control and ability. Section 1-1.18, "Engineer," of the *Standard Specifications* defines the term "engineer."

The engineer will focus on the details and methods of performing the work only if one or more of the following conditions exist:

- If the details and methods of performing the work are specified
- If the essential attribute or end result cannot be measured
- If public safety or convenience is involved

Otherwise, the details and methods must be left to the contractor's discretion.

3-502A Resident Engineer

The resident engineer (subject to delegation of authority within the district) is the authorized representative of the chief engineer on the project; therefore, contacts and correspondence should be between the contractor and the resident engineer.

Resident engineers must report their assignments to all interested parties by submitting Form CEM-0101, "Resident Engineer's Report of Assignment." Submit this form at the earliest possible time.

Good working relationships between the resident engineer and the contractor do much to encourage an effective, efficient project and can minimize misunderstandings and disputes.

3-503 Plans and Working Drawings

3-503
Plans and Working
Drawings

The contract may require that plans and working drawings be submitted to the engineer for approval. Caltrans has established a formal procedure for the approval of such plans for those facilities designed by the Office of Structure Design. For the procedures for buildings, see Section 132 of the *Bridge Construction Records and*

Procedures Manual, Volume II. These procedures should be reviewed when applicable to resident engineers. Similar procedures are used for pumping plants and electrical and mechanical equipment. The district must establish similar procedures for those facilities designed in the district.

In addition, the contract may require plans and calculations be submitted to the resident engineer for review and approval for falsework, shoring, and bridge demolition. For guidelines for the review and approval process see sections 120, 122, and 124, respectively, of the *Bridge Construction Records and Procedures Manual*, Volume II.

3-503A Trench Excavation Safety Plans

For each location, the contractor must submit a specific plan describing how workers will be protected from the hazards of ground caving in.

Simply stating that the *Construction Safety Orders* will be followed does not constitute a plan.

3-504 Order of Work

3-504 Order of Work

If the plans or special provisions do not contain a specified sequence of operations, contractors may select their own schedules, provided the planned order of work meets any dates specified for completion and openings of portions of the work to traffic.

Occasionally, the contractor may submit a proposed modification of the specified order of work that will be more satisfactory for the work's operation. If, in the resident engineer's opinion, Caltrans will benefit as much or more by adopting this proposal as it would under the specified plan, the contractor's plan may be implemented with a contract change order requested by the contractor. Caltrans must receive a monetary adjustment if the contractor has any reduced costs from the change. Also, a contractor may benefit if a change is proposed and accepted under a change order for a cost reduction incentive. See Section 3-514, "Cost Reduction Incentive," of the *Construction Manual* (manual) and Section 5-1.14, "Cost Reduction Incentive," of the *Standard Specifications*.

The resident engineer must recheck the specified plan of operations during the work's progress. Changes in circumstances may necessitate altering the planned sequence and schedule. Stage construction is often a part of the contract on major projects, and revised progress schedules may be required as the stages of work develop.

3-505 Superintendence

3-505 Superintendence

As required by Section 5-1.06, "Superintendence," of the *Standard Specifications*, contractors, including those in a joint venture, must name, in writing, one authorized representative. Resident engineers must insist contractors meet this requirement promptly. In case of disagreement among the contractors' representatives, the resident engineer can then contractually refuse to deal with more than one representative.

3-506 Lines and Grades

3-506
Lines and Grades

Section 5-1.07, "Lines and Grades," of the *Standard Specifications* requires the engineer to establish any lines and grades necessary to permit satisfactory completion of the specified work. For information on construction surveys, see Chapter 12, "Construction Surveys," of the *Caltrans Surveys Manual*.

To establish line and grade, the district surveys unit must set the construction marks and stakes.

3-507 Inspection

3-507
Inspection

The resident engineer and assistant resident engineers have a primary duty to obtain compliance with the *Standard Specifications*, special provisions, and plans within the tolerances specified in these documents. When tolerances are not specified, the engineer must use judgment in determining the allowable deviation consistent with the usage of the trades involved.

Section 5-1.08, "Inspection," of the *Standard Specifications*, allows the engineer access to the work for the purpose of an inspection. The engineer must take full advantage of this access. Rarely can an engineer adequately inspect work from the seat of a car or pickup truck.

3-508 Removal of Rejected and Unauthorized Work

3-508
Removal of Rejected and Unauthorized Work

Section 5-1.09, "Removal of Rejected and Unauthorized Work," of the *Standard Specifications*, specifies the contractor's responsibility for rejected or unauthorized work.

Unauthorized work includes excavation outside planned slopes and below the grading plane. Unless an approved contract change order authorizes such excavation, do not permit it.

Section 3-603, "Defective Materials," in this manual, discusses the rejection of material that fails to meet specified requirements. Rejected material must be removed and replaced. When rejected material is remedied, it may remain in place only when the engineer gives written approval. In most cases, this approval requires a contractor requested contract change order. For instance, a contract change order would be necessary to approve a contractor's proposal to remedy out-of-specification aggregate base by adding additional aggregate to material deposited previously. A contract change order in this situation is necessary because the remedy requires a change in specifications. However, the engineer's written approval is not required when the remedy is specified, such as the remedy for damaged galvanizing of pipe or guardrail.

For all material used in the work, make the payment in accordance with the specifications. As an alternative to removal and replacement, do not allow defective material to remain in place without contract payment. Any such action must be provided for in the specifications under "operating range" and "contract compliance" or provided by an approved contract change order.

3-509 Equipment and Plants

3-509
Equipment and Plants

Section 5-1.10, "Equipment and Plants," of the *Standard Specifications*, requires each piece of equipment to have a number stamped or stenciled upon it. The identifying number should further be referenced to the license plate issued for the piece of equipment. This additional reference is especially important in the case of tractor and trailer combinations where the tractor may pull different trailers on separate occasions.

The engineer must use the identifying numbers to keep records of working and idle time for both the equipment and operators, including, among other items, contract items, extra work, move in and out, and plant erecting. Some items of work will require more complete records than other items. The resident engineer must determine which items of work need these records and how much detail will be necessary. Records of this kind are also required for costs when the quantity of certain contract items runs over 125 percent or under 75 percent of the estimated quantity.

Caltrans personnel must not instruct the contractor's employees in equipment operation. The resident engineer must be very careful in this area because the contractor may interpret suggestions as the engineer's direct orders. Caltrans personnel must also not adjust the contractor's equipment or ride on equipment other than that designed for personnel transportation or as required to inspect specific features of the work.

3-510 Alternative Equipment

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In lieu of specified equipment, Section 5-1.11, "Alternative Equipment," of the *Standard Specifications,* provides for the use of new or improved equipment subject to satisfactory performance as determined by the engineer.

Contract change orders must cover all modifications under Section 5-1.11. Do not adjust cost for such changes.

3-511 Differing Site Conditions

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When a differing site condition occurs, Section 5-1.116, "Differing Site Conditions," of the *Standard Specifications,* provides recourse for Caltrans and the contractor. When a differing site condition arises, the resident engineer or structure representative should consult with the district materials unit or the Office of Materials Engineering and Testing Services. The following presents the two types of differing site conditions that exist, followed by the procedure to recover damages or savings for a differing site condition claim:

3-511A Type 1

Type 1 consists of actual subsurface or latent physical conditions materially different from those indicated in any of the following:

- The contract
- The log of test borings
- Other records of geotechnical data obtained by Caltrans' investigation of subsurface conditions
- The "materials information"
- Other records of data to the extent they were available to the contractor prior to the opening of the bids
- Or an examination of site conditions above ground

3-511B Type 2

Type 2 consists of unknown physical conditions of an unusual nature that are materially different from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract.

3-511C Procedure

For the contractor to recover damages for a differing site condition claim, the following things must be done:

- Before the bid, the contractor must investigate the site and carefully examine the following items:

  1. Plans
  2. Specifications
  3. "Materials information"
  4. Log of test borings
  5. Other records of geotechnical data (cores and other physical data) obtained by Caltrans' investigation of subsurface conditions
  6. Other records of data to the extent they were available to the contractor.

This investigation is required by Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the *Standard Specifications*.

- The conditions encountered must either be materially different from those represented by the bid documents, other records of data available to the contractors prior to bid, and a site investigation, or be materially different from those normally encountered or inherent in the industry.
- Before disturbing the conditions, the contractor must provide to the resident engineer written notice of them.
- The resident engineer must then investigate the conditions and determine if they differ materially and cause an increase or decrease in the cost or time to do the work.

The resident engineer must remain alert to the possibility that a differing site condition may result in a credit to the state. If such a condition is encountered, the resident engineer must promptly notify the contractor in writing.

The specifications for differing site conditions do not apply to those situations covered in the *Standard Specifications* under Section 8-1.09, "Right of Way Delay", Section 8-1.10, "Utilities and Non-Highway Facilities", or Section 19-1.04, "Removal and Disposal of Man-Made Objects."

Differing site conditions are not considered "changes in character" because the conditions do not result from ordered changes. However, determine and give compensation or credit due to differing site conditions in the same manner as you would for changes in character. For how compensation is made for changes in character and for a sample contract change order, see Section 5-3, "Contract Change Orders," of this manual.

3-512 Character of Workers

3-512 Character of Workers

Section 5-1.12, "Character of Workers," of the *Standard Specifications*, covers the issue of character of workers. In addition, Caltrans policy calls for a work environment with zero tolerance for violence, threats, harassment, and intimidation. This policy also applies to any subcontractor or employee of a contractor in their dealings with Caltrans personnel. Caltrans may discharge a worker from the project for engaging in any of the above mentioned activities.

Discuss the decision to remove a worker with the worker's supervisor prior to issuing the directive. The contractor may request reinstatement of the worker. If requested, the resident engineer's supervisor conducts a meeting with the resident engineer, the contractor's authorized representative, and, at the contractor's discretion, the affected worker. The reason for removal and the contractor's request for reinstatement are discussed at the meeting.

None of these procedures affects the authority of the resident engineer to direct the removal of a worker from the project.

3-513 Final Inspection

3-513 Final Inspection

As a project's completion approaches, the resident engineer must schedule appropriate reviews with maintenance, traffic, and safety personnel.

To resolve any potential problems on interstate projects, request a field engineer from the Federal Highway Administration to review the project before the day of final inspection. Your objective is to prevent last-minute delays in contract acceptance.

According to Section 5-1.13, "Final Inspection," of the *Standard Specifications*, the engineer must do a final observation of the contract work during the final inspection. The district director or an engineer from the district construction, such as the district construction deputy director, construction engineer, structure construction engineer, or resident engineer, must make the final inspection.

Maintain a record of the final inspection in the resident engineer's daily report. The record should state something along the following lines:

> "I made a final inspection of the project today and determined that all contract work has been completed."
>
> *Or,*
>
> "(Name) made the final inspection today and concurred that all contract work has been completed."

Time the final inspection so that the recommendation for contract acceptance will not be delayed pending the inspection. Before the final inspection, give the contractor a written list of items needing attention.

3-513A Work for Other Agencies or Owners

When any work performed under the contract is for other agencies or owners, as a courtesy ask for the concurrence of these entities in the acceptability of the work. Include the concurrence of others such as local agencies, other state agencies, utility companies, and school districts.

Also ask for concurrence from another party or agency if it finances a state highway project or a portion of the project. The district must arrange a joint field inspection with the owner or agency. In writing and in advance (usually 30 days), notify the owner or agency when the facility will be ready for final inspection. Time the inspection so that concurrence for acceptance is available at the time of recommending to the director the acceptance of the contract or relief from responsibility for maintenance. However, do not withhold recommendations for acceptance or relief merely because an outside agency will not concur.

The letter notifying the owner or agency of readiness for inspection should include the following:

- A reference to the agreement.
- A statement that the inspection is to determine whether work is in compliance with plans, the agreement, or both.
- The date of the inspection.
- A request that when an inspection reveals no deficiencies, the agency's authorized representative responsible for performing the inspection will confirm in writing that the agency agrees to accept the work.
- A statement that failure by the agency to inspect or confirm acceptance in writing will be deemed acceptance of the work as constructed.

If the size or complexity of the work warrants such an action, an agency representative and the resident engineer should make a preliminary joint inspection to correct minor deficiencies before the final inspection described above.

The resident engineer must record in writing preliminary and final joint field inspections, noting what actions were necessary to complete the work to the satisfaction of the agency representative. If the agency representative is satisfied with the completeness but declines concurrence in writing, record this situation.

3-514 Cost Reduction Incentive

3-514 Cost Reduction Incentive

Caltrans encourages contractors to develop and implement innovative approaches to construction projects. When new approaches result in construction cost savings, Caltrans and the contractor may share the savings in construction cost. Section 5-1.14, "Cost Reduction Incentive," of the *Standard Specifications*, specifies the method and procedure for sharing construction cost savings. A contractor's proposal made in accordance with Section 5-1.14 is called a cost reduction proposal.

The special provisions may allow for the contractor and engineer to organize and participate in a "value analysis" workshop. The workshop's purpose is to identify value-enhancing opportunities that would reduce the total project cost, time of construction, or traffic congestion. Items identified in the workshop could be developed into cost reduction proposals.

Section 5-1.14 applies only to the actual cost of construction. Savings in construction engineering, maintenance, operations, safety, and traffic services, among other items, are not eligible for sharing with the contractor.

3-514A Procedure

Handle cost reduction proposals as follows:

- After discussing the merits of a potential cost reduction proposal with the resident engineer, the contractor may submit a written proposal for approval. The initial written proposal may be preliminary in nature, but for Caltrans to evaluate the anticipated cost savings or other value enhancement, the proposal must provide enough of the information required by Section 5-1.14, "Cost Reduction Incentive," of the *Standard Specifications*. Thus, the proposal must include information regarding the following:

  1. Any construction effects related to staging, right-of-way, or environment
  2. Any required permits or permit modifications
  3. Maintenance or enhancement of essential functions or characteristics of the project such as service life, reliability, economy of operation, ease of maintenance, desired appearance, conformity to design, safety and other applicable standards, and the time within which the engineer must make a decision on the proposal.

- With assistance from the resident engineer, the construction engineer must coordinate Caltrans' evaluation of the written proposal by the date requested by the contractor.

- Consider the following factors in determining whether or not a proposal is acceptable. (Do not include any cost benefit resulting from these factors in the actual computation of net savings in construction costs.)

  1. Any engineering, environmental, legal or administrative considerations making the proposal impractical or unacceptable.
  2. The relationship of net savings to the cost of evaluating and implementing the proposal
  3. Any total benefit to the public including construction savings or reduced engineering costs
  4. Improved operations
  5. Reduced maintenance
  6. Improved safety and traffic service or other values that clearly favor the proposal

- Compute a cost reduction proposal's net savings due to the changed work in accordance with the methods detailed in Section 4-1.03C, "Changes in Character of Work," of the *Standard Specifications*. The net savings must result from the difference in the actual cost of doing the work in accordance with the contract plans and specifications as originally planned and the actual cost of doing the work based on designs, methods, labor, equipment and materials as changed by the proposal. In determining the net savings, exclude from consideration the contractor's engineering and other costs incurred in preparing the proposal. Also exclude Caltrans' cost of evaluating the proposal, including any portion of this effort for which the contractor paid.

- If the submitted proposal appears acceptable, but Caltrans' anticipated engineering costs are high, the contractor must stipulate in writing a willingness to share such costs before the proposal will be evaluated further. This willingness must be stipulated whether or not the proposal is ultimately adopted. Such a letter from the contractor provides the district with the authority to deduct engineering costs from progress payments. To record Caltrans engineering costs, proceed as follows:

  1. For the phase 3 expenditure authorization, establish a subjob number. Establish this number regardless of the proposal's subsequent approval or rejection. Charge all time spent evaluating the proposal to the subjob number.

  2. To provide the means of segregating costs, the district must immediately prepare and submit for master file the subjob number. After executing the change order for the cost reduction proposal, do not charge construction engineering to the subjob number.

  3. In conformance with Section 5-1.14, "Cost Reduction Incentive," of the *Standard Specifications*, you may deduct from progress payments a portion of Caltrans' engineering costs for evaluating the cost reduction proposal. Use the following method to determine the deduction. If Caltrans' engineering costs (A) exceed Caltrans' share (B) of the total computed net savings, deduct the difference (A minus B) from progress payments. Inform the contractor of the reason for any deductions.

- If the submitted proposal provides for a substantial benefit to the public but no net savings, the engineer may still proceed with issuing a contract change order based on public benefit. However, the contract change order would not be written as a contract change order for a cost reduction proposal but as an engineer-requested contract change order.

- If the district construction deputy director (or if applicable, the Division of Construction contract reviewer) determines that a preliminary written proposal is acceptable, the contractor may submit a complete proposal. The proposal must contain all information required by Section 5-1.14, "Cost Reduction Incentive," of the *Standard Specifications.* This information must be in sufficient detail to enable a final review and approval. The information provided should answer all questions that arose from Caltrans' review of the preliminary proposal. It must also include applicable calculations, revised plans, and revised specifications. To resolve issues, the contractor and the resident engineer may need to have additional meetings and discussions. Before forwarding the proposal for final review by the appropriate units, ensure the proposal is complete.

- In accordance with Section 5-1.14, "Cost Reduction Incentive," of the *Standard Specifications*, prepare a contract change order to authorize the cost reduction proposal. For guidance in preparing a contract change order for a cost reduction proposal, see Section 5-313, "Cost Reduction Proposal," in this manual. Carefully consider the contract change order's clauses covering payment to the contractor. In the contract change order, resolve all compensation and other issues related to the proposal. Before starting the authorized work, the contractor must execute and the engineer must approve the contract change order.